

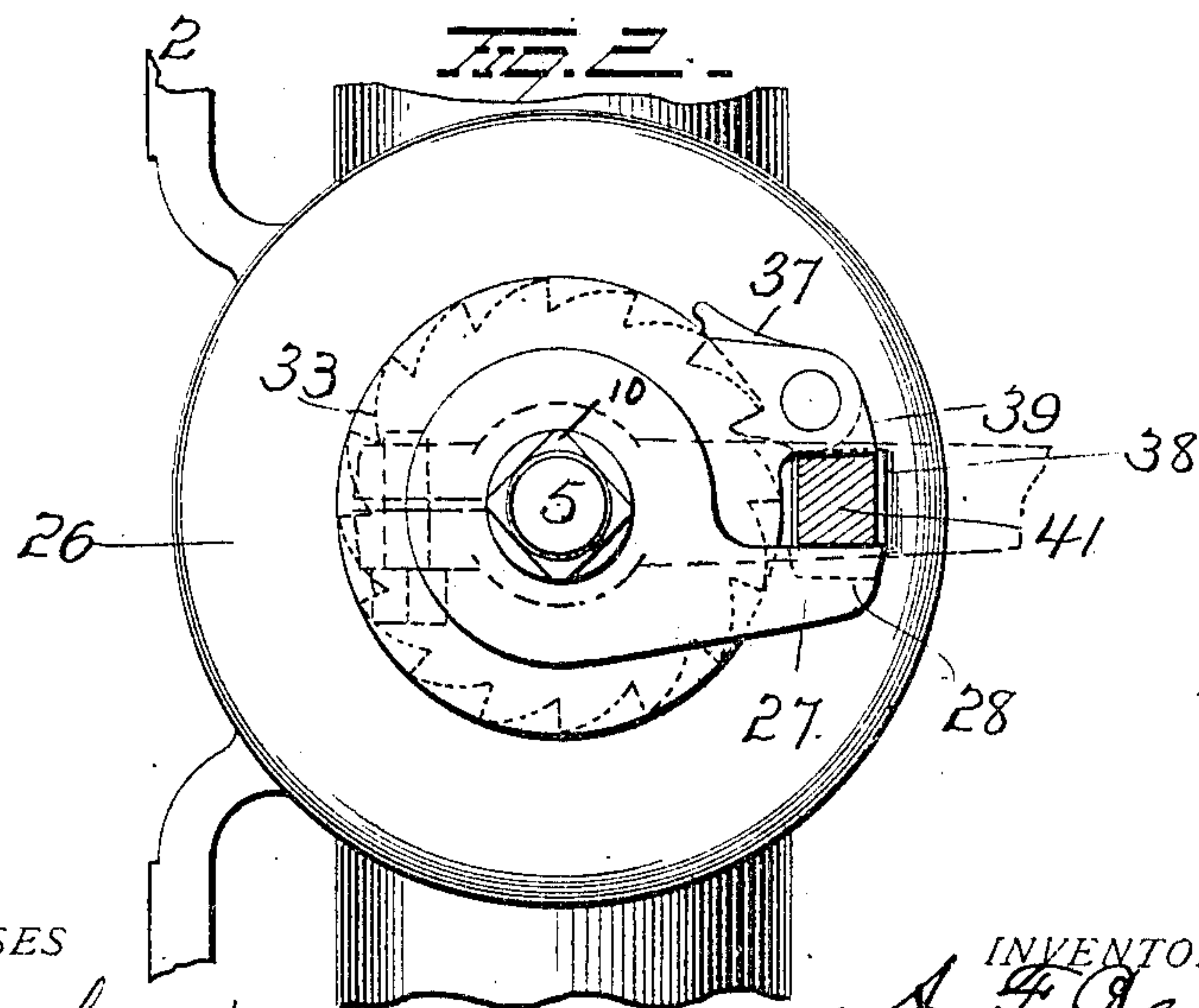
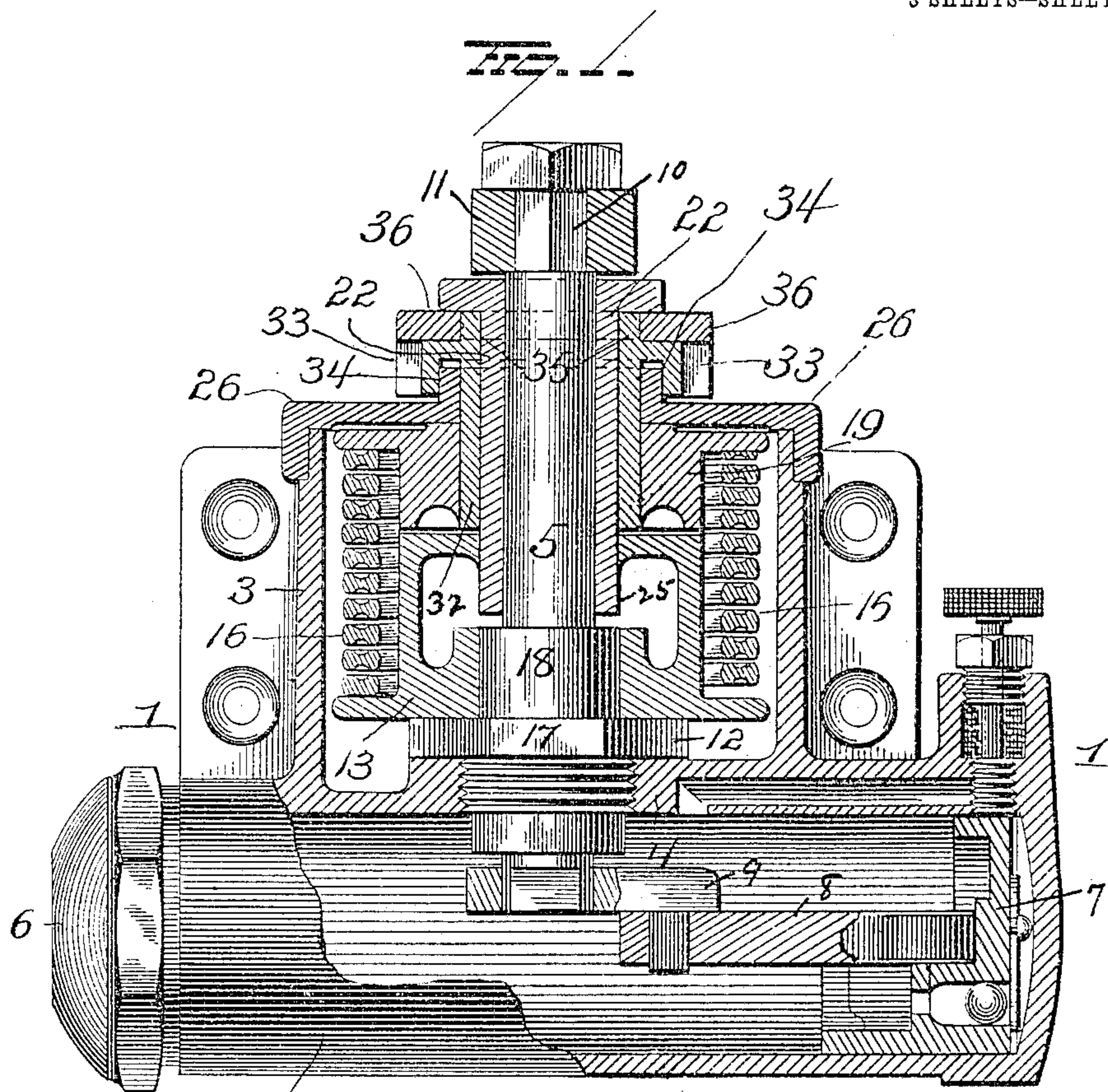
No. 818,600.

PATENTED APR. 24, 1906.

A. F. BARDWELL.
COMBINED DOOR CHECK AND CLOSER.

APPLICATION FILED DEC. 2, 1904.

3 SHEETS—SHEET 1.



WITNESSES

WITNESSES
E. D. Nottingham
G. F. Downing

INVENTOR

INVENTOR
A. F. Gardwell
By H. A. Seymour
Attorney

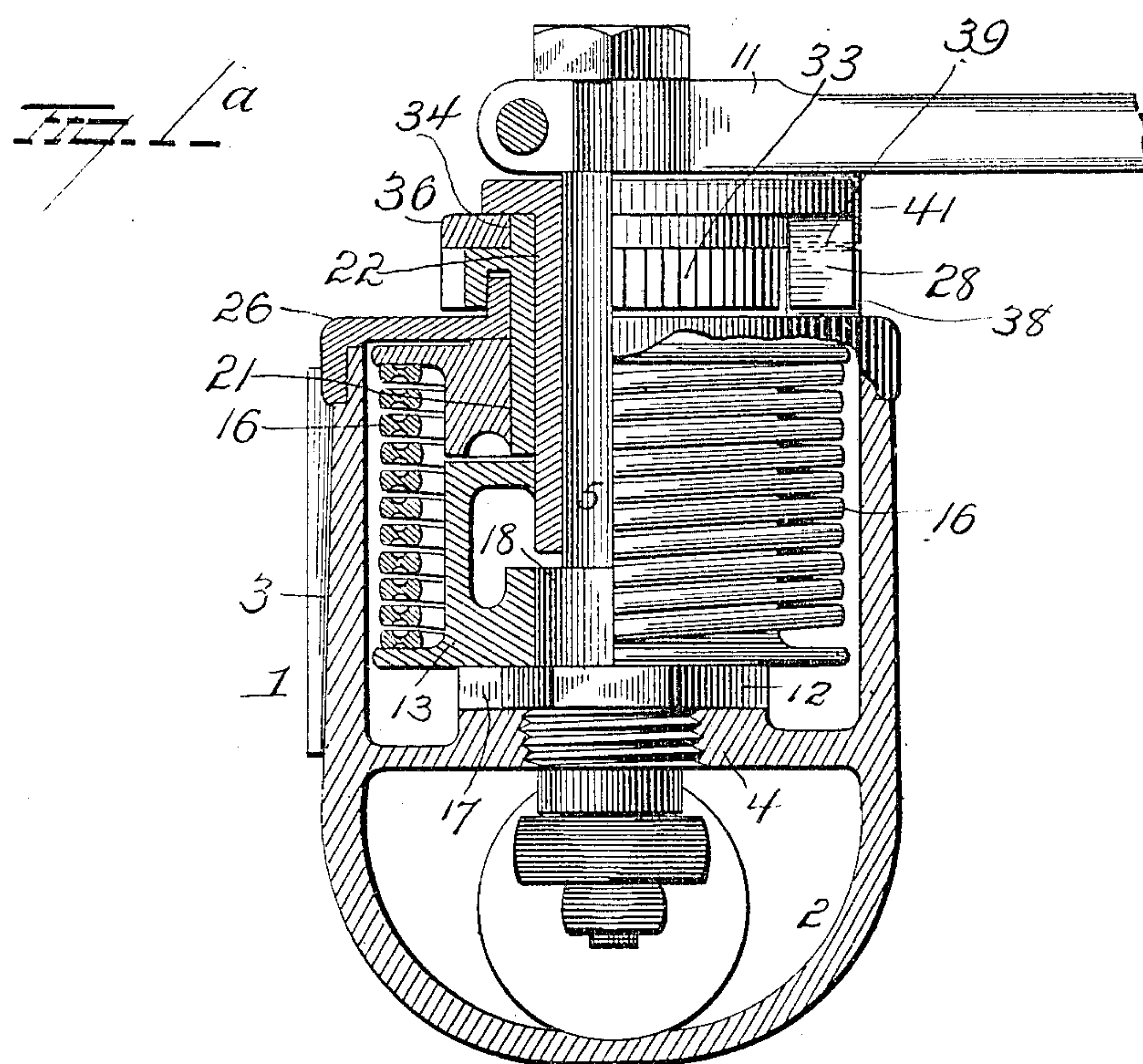
No. 818,600.

PATENTED APR. 24, 1906.

A. F. BARDWELL.
COMBINED DOOR CHECK AND CLOSER.

APPLICATION FILED DEC. 2, 1904.

3 SHEETS—SHEET 2.



WITNESSES
E. W. Wittingham
G. F. Downing

INVENTOR
A. F. Cardwell
By H. A. Seymour
Attorney

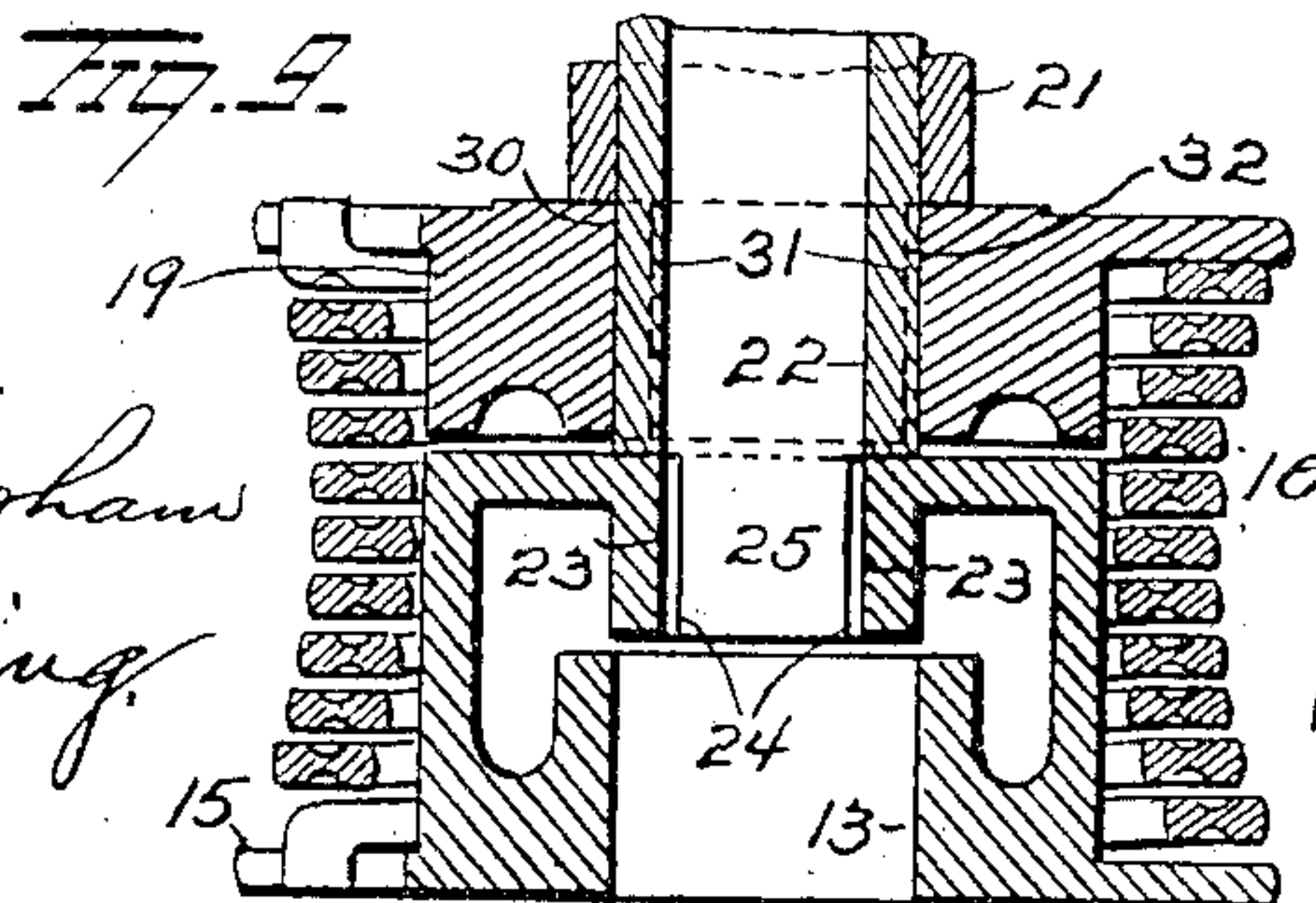
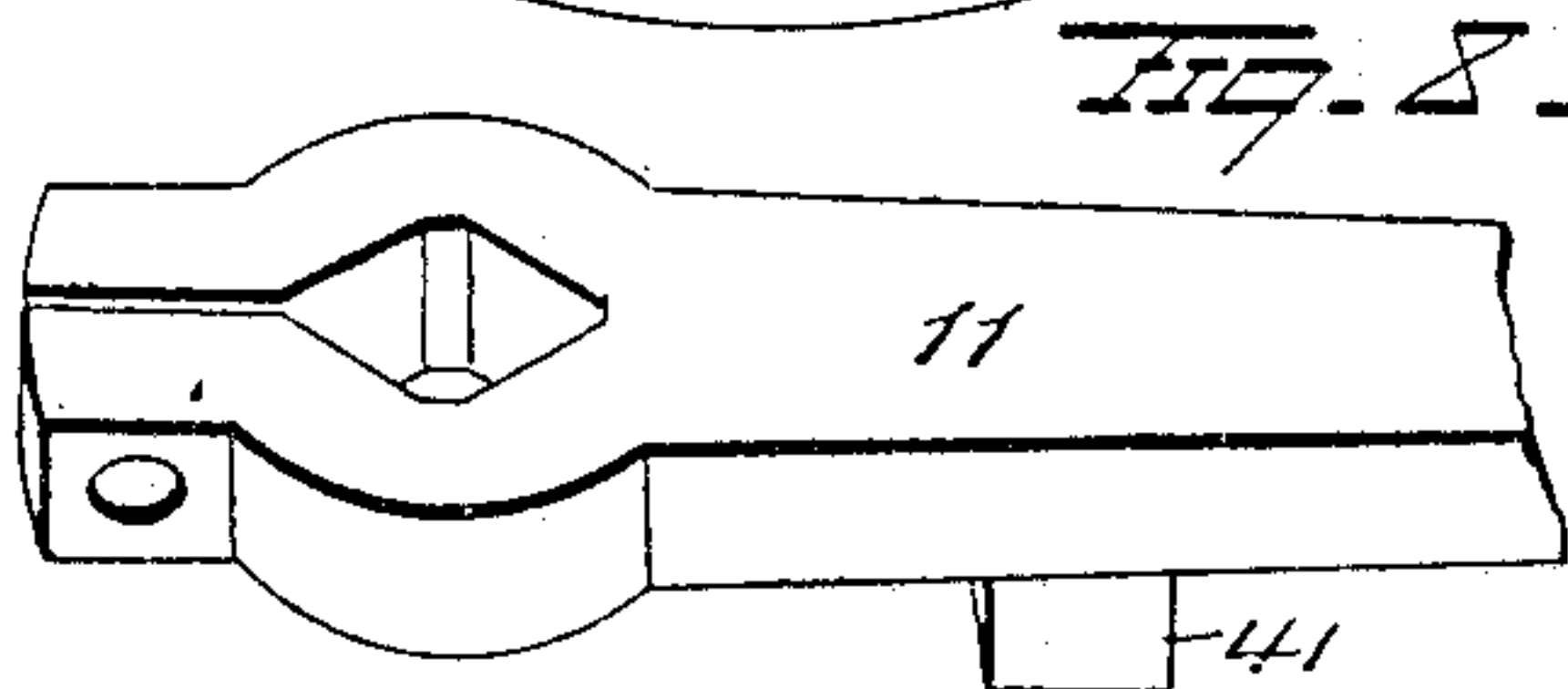
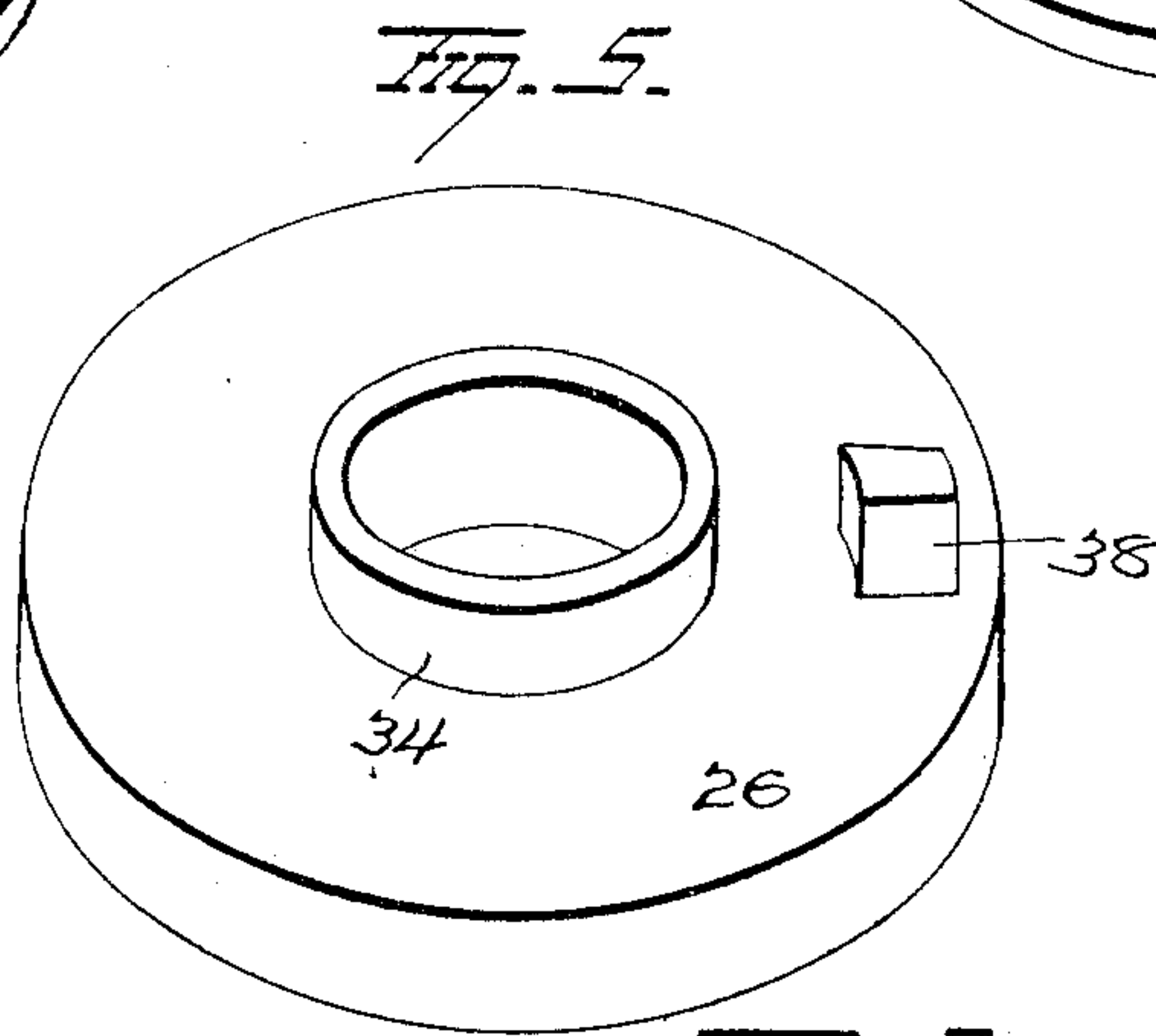
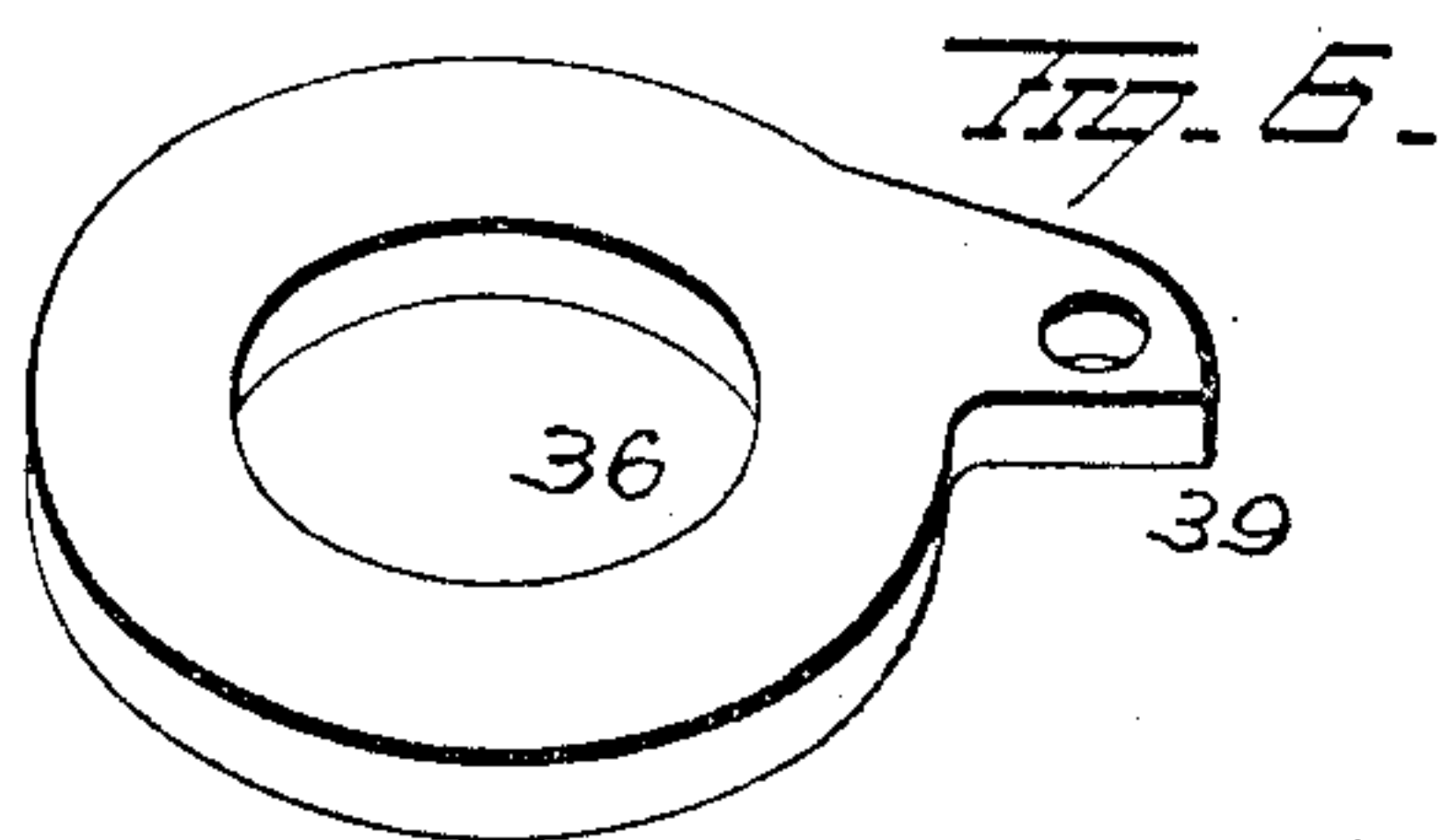
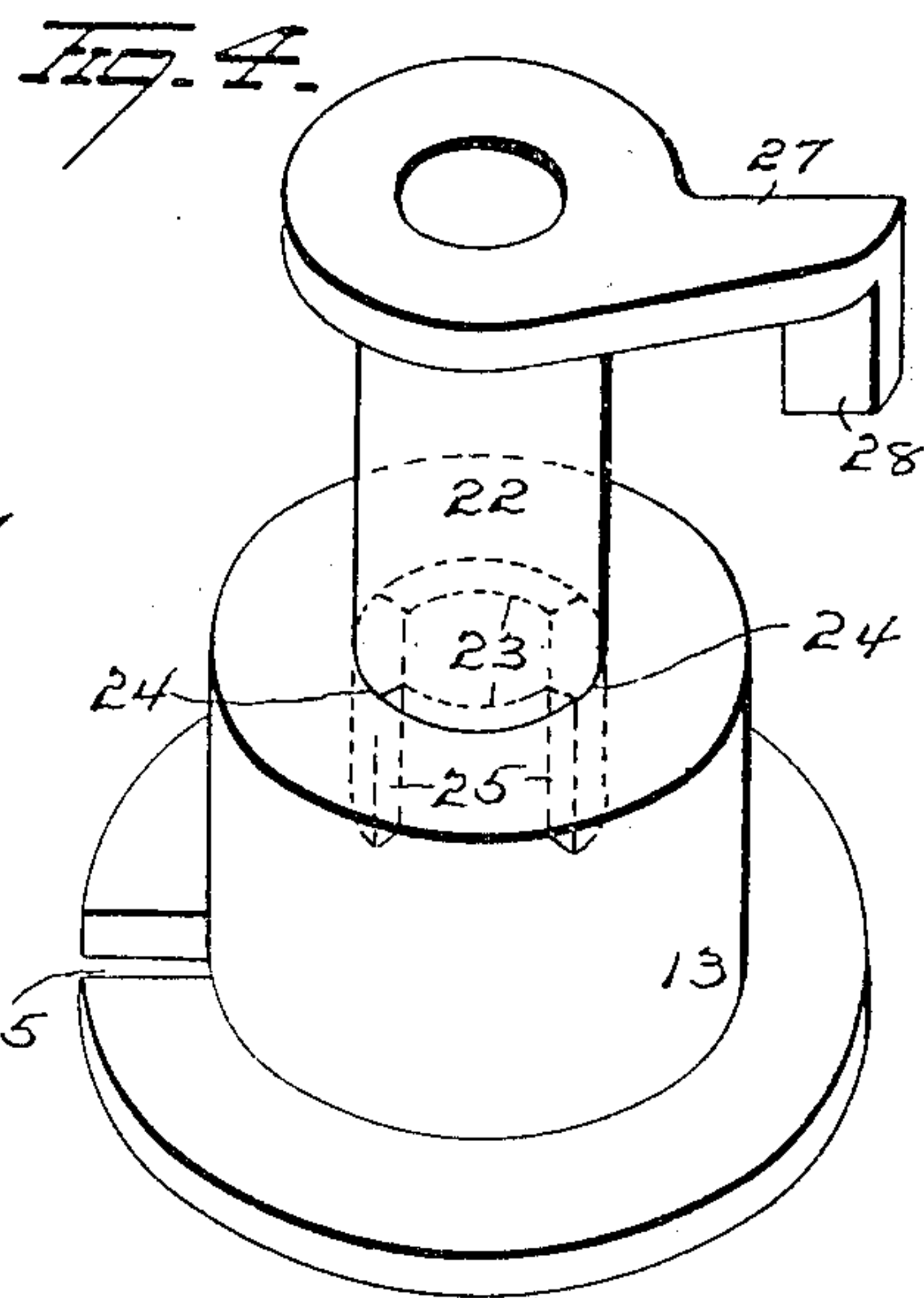
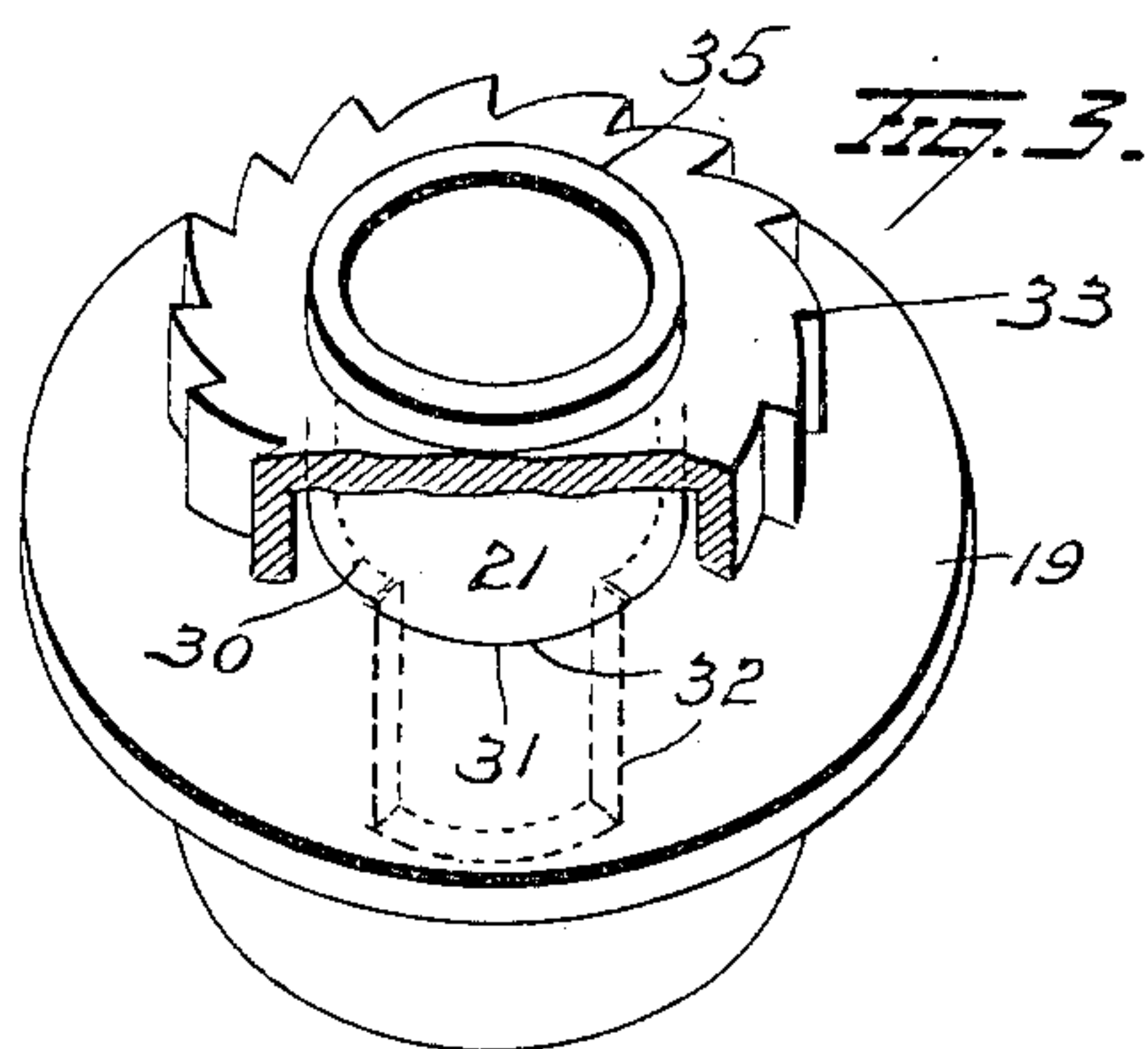
No. 818,600.

PATENTED APR. 24, 1906.

A. F. BARDWELL.
COMBINED DOOR CHECK AND CLOSER.

APPLICATION FILED DEC. 2, 1904.

3 SHEETS—SHEET 3.



WITNESSES
E. J. Nottingham
G. F. Downing

INVENTOR
A. F. Bardwell
By *H. A. Seymour*
Attorney

UNITED STATES PATENT OFFICE.

ARTHUR F. BARDWELL, OF STAMFORD, CONNECTICUT, ASSIGNOR TO
THE YALE & TOWNE MANUFACTURING COMPANY, OF STAMFORD,
CONNECTICUT.

COMBINED DOOR CHECK AND CLOSER.

No. 818,600.

Specification of Letters Patent.

Patented April 24, 1906.

Application filed December 2, 1904. Serial No. 235,206.

To all whom it may concern:

Be it known that I, ARTHUR F. BARDWELL, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain
5 new and useful Improvements in a Combined Door Check and Closer; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which
10 it appertains to make and use the same.

My invention relates to an improvement in combined door checks and closers, the object being to provide an entirely efficient and durable check and closer adapted for use on
15 either right or left hand doors or double-acting doors without any change or adjustment whatsoever; and it consists in the parts and combinations of parts, as will be more fully described, and pointed out in the claims.

20 In the accompanying drawings, Figure 1 is a view in vertical section through the spring-chamber, one end of the cylinder being also shown in section. Fig. 1^a is a view in transverse vertical section through the spring-chamber and cylinder, showing one half of
25 the mechanism within the spring-chamber in elevation and the other in section. Fig. 2 is a view in plan, the lever-arm being omitted. Fig. 3 is a view in perspective of the upper hub with its thimble seated on and connected
30 therewith. Fig. 4 is a similar view of the lower hub and its thimble. Fig. 5 is a perspective view of the cover for the spring-case. Fig. 6 is a perspective view of the pawl-carrying disk. Fig. 7 is a view of the pawl. Fig.
35 8 is a view of a section of the lever-arm; and Fig. 9 is a view in section through the upper and lower hubs and thimbles, the spring being shown under tension.

40 1 represents the casing, comprising the cylinder 2 and the spring-chamber 3, the cylinder being disposed below the spring-chamber and separated therefrom by a partition 4, located at the base of the spring-chamber and
45 provided with an opening for the passage of the spindle 5. The cylinder 2 is in one casting except at one end, where it is closed by the removable screw-cap 6.

50 Located within the cylinder is the piston 7, which latter may be of any of the well-known forms now in common use, means being provided for controlling the flow of the liquid from

the front to the rear of the piston. The construction of the piston forms, however, no part of my present invention, nor do I limit
55 the application of the closing features of the device to any particular form of checking devices.

The piston is connected by piston-rod 8 with the crank 9 of the spindle 5, and the
60 piston rests normally at one end of the cylinder with the rod 8 and crank 9 in line, so that a rotation of the spindle 5 in either direction will move the piston away from its normal
65 seat.

The spindle 5 passes up centrally through the spring-chamber 3 and is made with an angular upper end 10 to receive the lever-arm 11. Hence it will be seen that when the
70 lever-arm is moved by the act of opening the door the spindle will be turned and the piston moved toward the spindle, whereas when the lever-arm is moved by the spring, as in closing the door, the piston moves toward its normal
75 seat.

Located within the spring-chamber 3 and resting on the flange 12 of nut 17 is the flanged spring-hub 13. This hub 13 is provided with a centrally-located bore to receive
80 the spindle 5 and is provided with a flange 14, having a slot 15, in which a bent end of the flat or fluted spiral spring 16 normally rests. The spindle 5 is mounted in the combination packing-nut 17, secured in partition
85 4, the hexagonal flange 12 of said nut forming a seat for the spring-hub 13, while the cylindrical upper end 18 of said nut forms a bearing on which hub 13 turns.

Mounted on the hub 13 is the flanged hub 19, to the flange 20 of which the upper end
90 of the spring 16 is secured. The hubs 13 and 19 are of the same diameter externally; but the bore of hub 19 is of greater diameter than the bore of hub 13, so as to receive the thimble 21, which latter embraces the thimble 22,
95 connected to hub 13. Hub 13 is provided with a central bore 23 for the spindle 5 and at diametrically opposite points with recesses 24, communicating with said central bore and adapted to receive the oppositely-disposed
100 lugs 25 on the lower end of thimble 22. This thimble projects up through the spring-chamber and through the cover 26 of the latter and is provided on its upper end with a

head having a central opening for the passage of the spindle 5 and with an arm 27, having a depending lip 28.

As the hubs 13 and 19 are flanged at their lower and upper ends, respectively, and as their bodies are of the same diameter, they form, in effect, a spool which limits the lateral contraction of the spring when the latter is under tension, as clearly shown in Fig. 9, thus materially increasing the power of the spring. A helical spring without any internal support naturally takes the curved position, as shown in Fig. 9, and if overwound would tend to unduly strain and distort, and thus injure, the spring. By using the spool the coils at the longitudinal center first engage the spool and are supported thereby, and as the winding is continued the other coils engage the spool until the spring is seated and supported throughout its entire length on or against the spool, thus becoming practically rigid and absolutely preventing overwinding.

The hub 19 is provided with a central bore 30 to receive the thimble 21 and with diametrically opposite recesses 31, communicating with said bore, to receive the lugs 32 on the lower end of thimble 21. This thimble is provided at its upper end with the ratchet-wheel 33, the latter being undercut, as shown in Fig. 1, to overlap the annular flange 34, formed on the cover 26 around the central opening in the latter. The ratchet-wheel 33 is provided with an upwardly-projecting annular flange 35, on which the head of thimble 22, having the arm 27, is seated, and mounted on said wheel 33 below the said head is the pawl-carrying disk 36. This disk carries the pawl 37, which latter engages the teeth of wheel 33.

The cover 26 for the spring-chamber 3 is provided with the upwardly-projecting lug 38, which when the parts described are assembled rests between the lip 28 on arm 27 and the heel of pawl 37 and forms a stop for limiting the movement of these parts toward each other. The lever-arm 11 is secured to the angular end of the spindle 5 above the head of arm 27 and is provided with a depending lug 41, which latter normally rests over lug 38 on cover 26 and between lip 28 and shoulder 39.

With the apparatus constructed as above described it will be seen that with the casing 1 secured to, say, a double-acting door and the lever-arm 11 to the door-frame if the door be opened in one direction the lug 41, bearing against lip 28 will turn thimble 22, and as the latter is connected to hub 13, will cause the latter to turn, and thus wind up the spring 16 from its lower end, the upper end being held meanwhile by the engagement of pawl 37 with lug 38. If now the door be closed and opened in the opposite direction, the lug 41 on lever-arm bearing against shoul-

der 39 will turn the plate 36, carrying pawl 37, and the latter being in engagement with ratchet-wheel 35 will turn the latter. As the wheel 33 turns its thimble 21 is also rotated, and as the latter is connected to the upper hub 19 the spring will be put under tension, starting from its upper end, the opposite end being held by its connection engaging the lug 38 on the cover 26.

The operations will be precisely the same on right and left hand doors. Hence after the parts have been once assembled they can be applied to double-acting doors or to right and left hand doors without any changes in its adjustment (except possibly to adjust the tension of the spring, which may be done in the usual and well-known manner) and without altering the relative position of any of its parts.

It is evident that may slight changes might be resorted to in the relative arrangement of parts shown and described without departing from the spirit and scope of my invention. Hence I would have it understood that I do not wish to confine myself to the exact construction and arrangement of parts herein shown and described; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a door-closer, the combination with a spring-chamber, of upper and lower hubs, a spring connected at one end to one hub and at its other end to the other hub, a thimble for each hub, the said thimbles extending up above the top of the spring-chamber, a lever arm, and means connecting the latter and thimbles.

2. In a door-closer, the combination with a spring-chamber and a spiral spring therein, of a hub connected to one end of the spring, a hub connected to the other end of the spring, a thimble attached to each hub, one thimble embracing the other, a lever-arm and means connecting the lever-arm and thimbles.

3. In a door check and closer, the combination with a spindle, a piston-chamber, and a piston in the latter and connected to the spindle, of a spring-chamber, upper and lower hubs, a spring connected at its ends to said hubs, a thimble for each hub, the said thimbles extending above the top of the spring-chamber, a lever-arm fast on the spindle and means thereon operatively connecting the latter and the thimbles.

4. In a door check and closer, the combination with a spindle, a piston-chamber and a piston within said chamber connected to the spindle, of two independently-movable hubs encompassing but free of said spindle, a spiral spring connected at its ends to said hubs, a thimble for each hub, each thimble extending above the spring-chamber, a lever fast on the spindle and having means thereon to engage both of said thimbles, and means

for holding one thimble and its hub against movement while the other is in motion or under tension.

5. In a door-closer, the combination with
5 a spring-chamber and spindle of two independently-movable hubs encompassing but free of said spindle, each hub having a thimble projecting above the spring-chamber, a spiral spring located within said chamber
10 and connected at its ends to said hubs, means for holding one thimble and its hub against movement while the other is in motion or under tension, a lever fast on said spindle, and means whereby when said lever is moved in
15 one direction it engages and turns one thimble and its hub and when moved in the opposite direction engages and turns the other thimble and its hub.

6. In a door-closer, the combination with
20 a spindle, a spring-chamber and a spiral spring therein, of a lower hub connected to one end of the spring, an upper hub connected to the other end of the spring, a thimble detachably connected to each hub and projecting through the top of the casing, a lever-arm fast on the spindle and means connecting
25 the thimbles and lever-arm.

7. In a door-closer, the combination with a spring-chamber a spiral spring therein, and
30 a spindle of a lower hub connected to one end of the spring, an upper hub connected to the other end, a thimble connected to each hub and projecting up through the top of the casing, an arm on one thimble, a ratchet-wheel
35 on the other thimble, a disk carrying a pawl engaging the ratchet-wheel and a lever-arm fast on the spindle and engaging the pawl-carrying disk and the arm on the thimble.

8. In a combined door closer and check,

the combination with a piston-chamber, a
40 piston therein, a spring-chamber and a spiral spring in the latter, of a spindle passing through the spring-chamber and connected to the piston, a lever-arm on the spindle, a
45 hub connected to the upper end of said spring, a hub connected to the lower end of the spring, a thimble connected to each hub, the said thimbles embracing but free of said spindle, and means operatively connecting
50 the lever and thimbles.

9. In a door-closer the combination with a helical spring, of a sectional spool, each section consisting of a body having an end flange, the bodies of the two sections of the
55 spool forming a continuous unbroken cylindrical bearing for the spring, whereby when the spring is being wound, the coils intermediate the end sections first engage the spool-sections, and thus cause the spring to exert
60 increased power.

10. In a combined door closer and check the combination with a sectional spool, a spindle passing centrally through the spool and connected to the piston, means embracing
65 the spindle and connected to the spool-sections or hub and a lever-arm for actuating the spindle and said means connected with the spool-sections, of a helical spring surrounding the spool and connected at its ends
70 to said spool-sections.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ARTHUR F. BARDWELL.

Witnesses:

SCHUYLER MERRITT,
W. H. TAYLOR.